

# Murchison Mountains Lesser Short Tailed Bat Monitoring



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Cover: Landing at the Log Cabin, Etrick Burn. *Photo: Warren Simpson DOC*

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# 1 Summary

Radiotracking individuals from the newly discovered southern lesser short tailed bat colony in the Murchison Mountains, Fiordland, lead to the discovery of a communal roosting area in the mid Etrick Burn. Preliminary population data resulted in a minimum population size of 208 bats, showing unequivocally that the population is communal and resident in the valley. At this stage the population is considered viable and has the ability to recover if sustained rat control begins in the area. However the 2019 beech mast event and subsequent rat plague could have a significant negative effect on this population and until rat control is put in place it remains highly vulnerable to extinction.

# 2 Introduction

A new population of southern lesser short tailed bats (*Mystacina tuberculata tuberculata*) was indicated in the Etrick Burn, Murchison Mountains, Fiordland, using acoustic recorder data in 2018 (Jackson 2018). Before this, southern lesser short tailed bats were thought to remain in only two locations, Whenua Hou/Codfish Island and the Eglinton Valley, Fiordland. This was an unnatural state due to the extinction of other populations and left the Eglinton Valley as the only surviving mainland population.

Bats in New Zealand are vulnerable to introduced predators (rats, stoats, feral cats, possums) throughout the year (Pyde et al. 2005) and short tailed bats are only known to have stable or increasing populations where intensive predator controls occurs, such as the Eglinton Valley, or where they are present on predator free islands, such as Whenua Hou. . Stoat trapping alone has been shown to be ineffectual in protecting STB colonies and large scale rat control is required for protection (Jackson and Pryde 2019). Further having limited populations makes species more vulnerable to inbreeding, disease and other stochastic events.

Short tailed bats are extremely hard to detect due to their nocturnal nature and small size, additionally they spend most of their time foraging deep inside the forest and only emerge when it is well dark. This results in large gaps in the knowledge of where bats reside which are difficult to fill without substantial time and cost. The development of acoustic recorders by the Department of Conservation's electronics team that record both NZ bat species as well as birds has made survey far more feasible and is greatly adding to our knowledge. There is however no project aiming to survey New Zealand comprehensively for bat presence and recordings often come from other projects with other aims.

In 2018 the Save Our Iconic Kiwi (SOIK) programme put out 160 acoustic recorders over a large area of Fiordland to monitor kiwi abundance throughout the park. These recorders were also set to record bats in the hours after kiwi data was collected resulting in over 300,000 recordings that were analysed by two individuals organised by the Biodiversity Group DOC.

One recorder located in the Etrick Burn, picked up 9 short tailed bat recordings in an area where short tailed bats had not previously been recorded, and 40km away from the known Eglinton population. This was followed up by the deployment of a further 111 recorders in November and December 2018 resulting in over 2000 short tailed bat

recordings. These were centred in the mid Ettrick Burn in an area of mainly red beech forest and indicated the new population. The Murchison Mountains is a special takahe protection area with a large scale stoat trapping network, however it has never had any form of rat control.

## 3 Objectives

To identify the roosting area of the Ettrick Burn lesser short tailed bat colony and estimate the population size and trend. Secondly to gather information on population relatedness between the two Fiordland colonies.

1. Catch and radio transmitter bats from the Ettrick Burn colony
2. Radio track bats to roost trees
3. Obtain roost emergence counts from communal roosts
4. Scan all bats for PIT tags
5. Insert new PIT tags if possible

## 4 Methods

### 4.1 Find roost trees

- a) Mist net bats and attach radio transmitters
- b) Follow radio tagged bats to roost trees, ascertain if communal or solitary where possible

### 4.2 Undertake roost emergence counts

- a) Follow radio tagged bats to roost trees, set up cameras and recorders to film for 2 hours during emergence
- b) Count recorded emergent bats from videos
- c) Compare and graph results with previous counts

### 4.3 Look for Eglinton PIT tagged bats

- c) Mist net bats and attach radio transmitters
- d) Hand scan caught bats for PIT tags
- e) Follow radio tagged bats to roost trees, set up antennae and data loggers on communal trees

### 4.4 Insert new Passive Integrated Transponder (PIT) tags

- a) Catch bats at active communal roosts and insert PIT tags into new unmarked bats as per the Best Practise Manual for Conservation Techniques for Bats (Sedgely et al, 2012)

- b) Record the age and sex for all bats caught and reproductive status for all females caught

## 5 Results

### 5.1 Roost trees

21 short tailed bats were caught in mist nets with 8 being adult females, 3 of which obviously pregnant. Transmitted bats led to the discovery of five roost trees, one communal, one solitary and the others unknown, see figure 1 below. Of the three unknown trees, two were climbed and investigated but the transmitted bat was in an unattainable limb and therefore the roost type could not be determined.

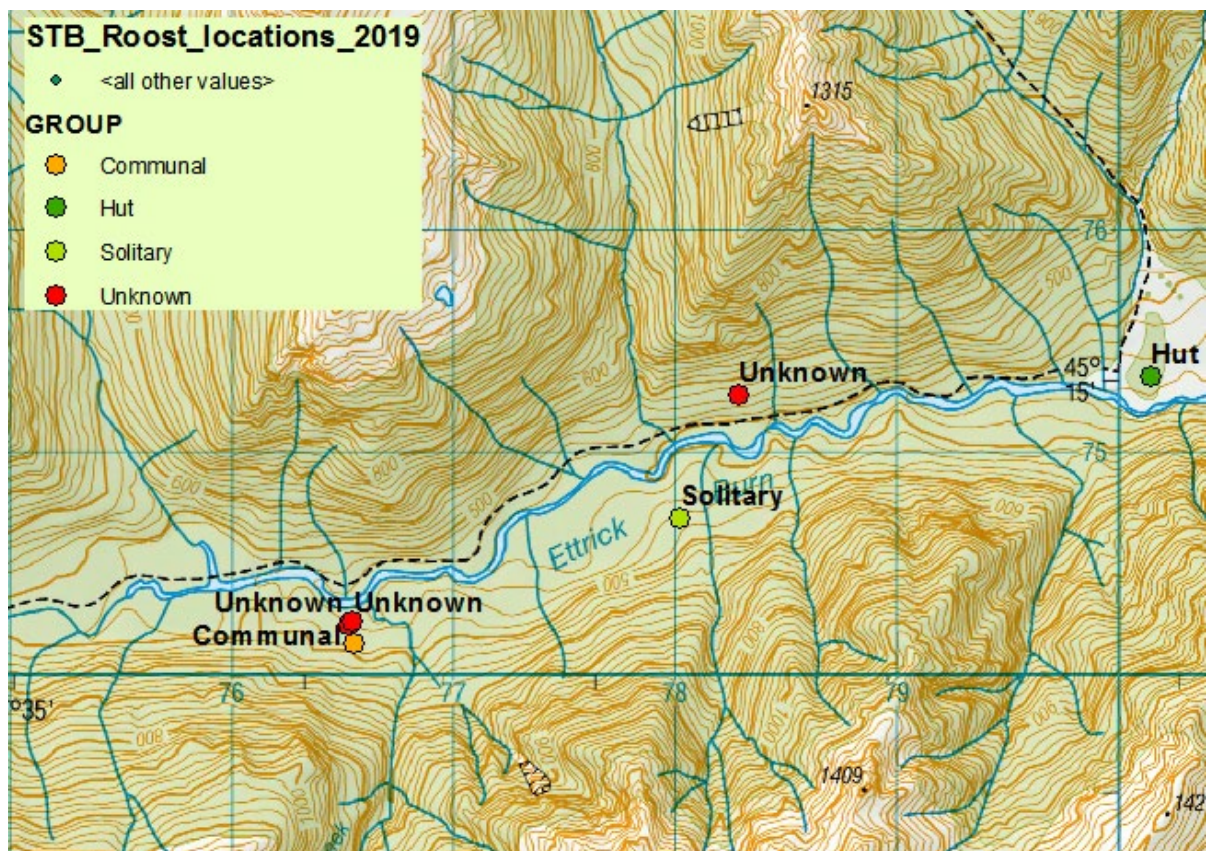


Figure 1. Bat roost locations in the Ettrick Burn, Fiordland.

## 5.2 Roost emergence counts

Two roost trees were videoed with 9 nights of roost emergence obtained. The highest count was 208 comprised of 207 individuals in one tree and 1 in another.

Table 1. Summary of roost emergence counts

Date	Roost Tree	Count
11/12/19	RE3	207
12/12/19	RE3	135
13/12/19	RE3	64
14/12/19	RE3	77
18/12/19	RE3	135
19/12/19	RE3	138
20/12/19	RE3	66
21/12/19	RE3	144
11/12/19	RE1	1

## 5.3 Search for tagged bats

The 21 bats caught in mist nets were hand scanned with no PIT tags found. An antenna and data logger were set up around the communal roost for 11 nights and also did not record any tags.

## 5.4 Inserting new PIT tags

Part way through the season the decision was made to not tag any new bats.

# 6 Discussion

The first monitoring season of the Etrick Burn southern lesser short tailed bat colony was undertaken during November/December 2019, during a period of extremely poor weather. This reduced the amount of time the team was able to undertake monitoring, however a range of initial data on the colony was still able to be collected.

The roosting area of the Etrick Burn STB colony was identified in the mid Etrick Burn, matching the results of the 2018 acoustic recorder survey. Whilst the acoustic recorder data strongly suggested a resident colony in the valley, this was confirmed with a communal roost being located and pregnant females captured. The identification of the roosting area will also contribute to the colony getting the greatest possible protection from any future rat control operations.

Roost emergence counts showed the minimum population size to be 208 bats. At this size the Etrick Burn colony is considered viable and has the ability to recover with adequate protection. Currently the population is at risk of extinction based on the outcomes of other unprotected populations such as the Oparara colony, Kahurangi National Park. Whilst rat control during the next beech masting event is mooted, the 2019 beech mast event and subsequent predator plague could have a detrimental effect on this population before that occurs.

Roost emergence counts are a crude population measure and often underestimate the population size, further as a monitoring method they are unable to show short term

population trends well. To gain accurate population trend data another method such as mark recapture and/or survival analysis will need to be undertaken.

Initially the project aimed, if conditions and time allowed, to place PIT tags in individuals from the Ettrick Burn colony for the purpose of future survival analysis. Part way through the season the decision not to tag was made due to time constraints preventing a large enough tagging effort this season. It is feasible to undertake PIT tagging in the future given that continued monitoring will be more efficient and the project adapted to maximise success. However PIT tagging bats should only be initiated with a minimum five year commitment to the project - necessary to ensure that there is sufficient value in undertaking the tagging.

The history of the Ettrick Burn colony is unknown with one option being that it was formed from a splinter group of the Eglinton colony - separated due to the Eglinton colony's population growth. Approximately a third of the Eglinton population is marked with PIT tags allowing us to use these tagged bats as an indicator of Eglinton bat presence. As no tagged bats were found in the Ettrick Burn colony this suggests the Ettrick Burn colony is not a recent splinter group and is a remnant population. Additional data from further years of study and genetic research would continue to inform on the relatedness and history of the two colonies.

## 7 Recommendations

1. Continue monitoring the population for at least five years to form a good understanding of the population and how it is responding to pest management
2. Investigate options for moving the work base closer to the roosting area; tent camp, flyable bivy
3. Instigate landscape scale rat control during the next beech masting event
4. Undertake genetic analysis

## 8 Acknowledgements

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## 9 References

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